ABSTRACT OF THE DISCLOSURE

The present invention is directed to low loss optical waveguides doped with tantala and methods of manufacturing such waveguides. SiO_2 soot is doped with Ta_2O_5 to form a soot blank which is consolidated under conditions suitable to prevent the crystallization within the Ta_2O_5-SiO_2 containing waveguides. The resulting cane is then either drawn into an optical fiber or overclad and subsequently drawn into an optical fiber. High temperature consolidation in either a gaseous atmosphere or vacuum atmosphere is used to sinter and vitrify the soot blank prior to drawing to produce a low loss optical waveguide fiber.